SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

Scheme of Teaching and Evaluation 2022-2023 (As per NEP-2020)

Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

(Effective from the Academic year 2022–2023)

I-SEMESTER BTech ECE/ IT/CSE

S.N.	Course Code	Course Title	Teaching Hours/ week			Examination				Credits
			Theory lectures	Tutorial	Practical/ Drawing	Examination in Hours	CIA Marks	SEA Marks	Total Marks	
			L	T	P					
1	AMUATB4	Engineering Mathematics - B	3	1	-	03	40	60	100	4
2	PPUATB2	Engineering Physics	3	1	-	03	40	60	100	4
3	ITUATE2	Introduction to Information Technology	3	-	-	03	40	60	100	3
4	ECUATE3	Basic Electrical Engineering	3	-	-	03	40	60	100	3
5	ELUATH1	English for Communication	3	-	-	03	40	60	100	3
6	ECUATH2/ CSUATH2/ITUATH2	Human Values & Ethics	1	-	-	02	50	-	50	1
7	PPUALB2	Engineering Physics Laboratory	-	-	2	03	25	25	50	1
8	MEUALL1	Engineering Graphics	1	-	3	03	25	25	50	3
9	ECUALE3	Basic Electrical Engineering Laboratory	-	-	2	03	25	25	50	1
10	NSUALS1	NSS	-	-	2	01	25	25	50	1
Total			**17**	**2**	**09**	**27**	**350**	**400**	**750**	**24**

Note: AM:Mathematics, PP:Physics, ME: Mechanical Engineering, IP: Industrial & Production Engineering, CE: Civil Engineering, CS: Computer Sc. & Engg., IT: Information Technology, PE: Physical Education, NS: NSS, U: Undergraduate, T: Theory, L: Laboratory,

BASIC SCIENCE (B)	ENGINEERING SCIENCE (E)	SKILL ENHANCEMENT COURSE (L)	HUMANITIES SCIENCE (H)	MANDATORY COURSE (C)	EXTRA-CURRICULAR ACTIVITIES (S)
1. Mathematics – A 2. Physics 3. Chemistry 4. Mathematics - B	1. Engineering Mechanics 2. Introduction to Information Technology 3. Basic Electrical Engineering 4. Basic Electrical and Electronics Engineering 5. Computer Programming 6. Basic Communication Engineering	1. Engineering Graphics 2. Engineering Workshop Practices	1. English for communication 2. Human Values and Ethics	1. Indian Constitution 2. Environmental Science & Ecology	1. NSS 2.Sports and Yoga

Credit Definition:

➢1-hour lecture **(L)** per week per semester = **1Credit**

➢1-hour tutorial **(T)** per week per semester = **1Credit**

➢2-hour Practical/Drawing**(P)** per week per semester = **1 Credit**

- **Four credit** courses are to be designed for **50** hours of Teaching-Learning process.
- **Three credit** courses are to be designed for **40** hours of Teaching-Learning process.
- **Two credit** courses are to be designed for **30** hours of Teaching-Learning process.
- **One credit** courses are to be designed for **15** hours of Teaching-Learning process

Note: The above is applicable only to THEORY courses

AICTE Activity Points to be earned by students admitted to B.Tech. programme (For more details refer to Chapter 6, AICTE Activity Point Programme, Model Internship Guidelines):

Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.

The activities can be spread over the years, any time during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, the minimum hours' requirement should be fulfilled. Activity Points (non-credit) donot affect SGPA/CGPA and shall not be considered for vertical progression.

Eligibility for UG Certificate:

A. **Undergraduate Certificate course will be offered by all departments of SoS(E&T), GGV.**

B. **For applicability of UG Certificate, the candidate who wants to exit after completing 1st year (02 semesters) BTech degree with 10 credits of skill-based courses lasting two months, including atleast 06 credits job specific internship/apprenticeship with NHEQF level 5/UCF level 4.5.**

C. **A student shall report to the concerned Head on or before the date notified by the Department/School/University, if he/she is interested to exit with UG Certificate**

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Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

(Effective from the Academic year 2022–2023)

II-SEMESTER BTech ECE/ IT/CSE

S. N.	Course Code	Course Title	Teaching Hours/week			Examination				Credits
			Theory lectures	Tutorial	Practical/ Drawing	Examination in Hours	CIA Marks	SEA Marks	Total Marks	
			L	T	P					
1	AMUBTB1	Engineering Mathematics - A	3	1	-	03	40	60	100	4
2	CYUBTB3	Engineering Chemistry	3	-	-	03	40	60	100	3
3	CSUBTE5	Computer Programming	3	-	-	03	40	60	100	3
4	ECUBTE6	Basic Communication Engineering	3	-	-	03	40	60	100	3
5	LAUBTC1	Indian Constitution	1	-	-	01	50	-	50	1
6	FOUBTC2	Environmental Science and Ecology	2	-	-	03	40	60	100	2
7	CYUBLB3	Engineering Chemistry Laboratory	-	-	2	03	25	25	50	1
8	IPUBLL2	Engineering Workshop Practices	-	-	2	03	25	25	50	1
9	CSUBLE5	Computer Programming Laboratory	-	-	2	03	25	25	50	1
10	PEUBLS2	Sports and Yoga	-	-	2		25	25	50	1
Total			**15**	**1**	**08**	**25**	**350**	**400**	**750**	**20**

Note: AM:Mathematics, PP:Physics, ME: Mechanical Engineering, IP: Industrial & Production Engineering, CE: Civil Engineering, CS: Computer Sc. & Engg., IT: Information Technology, PE: Physical Education, FO: Forestry, LA: Law, NS: NSS, U: Undergraduate, T: Theory, L: Laboratory,

BASIC SCIENCE (B)	ENGINEERING SCIENCE (E)	SKILL ENHANCEMENT COURSE (L)	HUMANITIES SCIENCE (H)	MANDATORY COURSE (C)	EXTRA-CURRICULAR ACTIVITIES (S)
1. Mathematics – A	1. Engineering Mechanics	1. Engineering Graphics	1. English for communication	1. Indian Constitution	1. NSS
2. Physics	2. Introduction to Information Technology	2. Engineering Workshop Practices	2. Human Values and Ethics	2. Environmental Science & Ecology	2.Sports and Yoga
3. Chemistry	3. Basic Electrical Engineering				
4. Mathematics - B	4. Basic Electrical and Electronics Engineering				
	5. Computer Programming				
	6. Basic Communication Engineering				

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Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.

The activities can be spread over the years, any time during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, the minimum hours' requirement should be fulfilled. Activity Points (non-credit) donot affect SGPA/CGPA and shall not be considered for vertical progression.

Eligibility for UG Certificate:

A. Undergraduate Certificate course will be offered by all departments of SoS(E&T), GGV.

B. For applicability of UG Certificate, the candidate who wants to exit after completing 1st year (02 semesters) BTech degree with 10 credits of skill-based courses lasting two months, including atleast 06 credits job specific internship/apprenticeship with NHEQF level 5/UCF level 4.5.

C. A student shall report to the concerned Head on or before the date notified by the Department/School/University, if he/she is interested to exit with UG Certificate

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	AMUATB4	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	04
Subject:	ENGINEERING MATHEMATICS - B	3	1	-	15	15	10	40			

Course Objectives:

1. To study the concepts of vector space, linear transformation, matrices and system of linear equations.
2. To find the roots of equations i.e. quadratic and bi-quadratic equations.
3. To study the concept of gradient, divergence, curl, Green's theorem, Gauss's theorem and Stokes's theorem and their applications.
4. To study the properties of complex numbers and to establish the relation between exponential, hyperbolic and logarithm functions.
5. To test the nature of infinite series i.e. convergence, divergence and oscillatory.

UNIT-1:**Linear Algebra**
Vector space, linear dependence and linear independence of vectors, linear transformations, rank and inverse by elementary transformations, system of linear equations – consistency and inconsistency, eigen value and eigen vectors, Caley-Hamilton theorem and its application to find the inverse.

UNIT-2: **Theory of equations**
Polynomial and polynomial equations, division algorithm, roots of equations, remainder theorem, factor theorem, synthetic division, fundamental theorem of algebra, multiplication of roots, descarte's rule of sign, Descarte's method.

UNIT-3: **Vector Calculus**
Vector functions, differentiation of vectors, velocity and acceleration, scalar and vector fieldm gradient of scalar field, directional derivative, properties of gradient, divergence of vector, curl of vector, point function, properties of divergence and curl, integration of vector function, line integral, surface integral, Green's theorem, gauss theorem, Stoke's theorem (without proof) and their simple applications,

UNIT-4: **Complex Number**
Complex numbers and its properties, conjugate complex numbers, standard form of complex numbers, De-Moivre's theorem, Roots of complex numbers, exponential function of complex variable, circular form of complex variable, Hyperbolic function of complex numbers, Logarithmic function of complex numbers.

UNIT-5: **Infinite Series**
Sequence, convergent, divergent, oscillating sequence, infinite series, behavior of infinite series, ratio test, root test, comparison test, Raabe's test, Logarithmic test.

Recommended Books:

1. N.P. Bali, A Textbook of Engineering Mathematics, Laxmi publications, 10th edition, 2016.
2. H.K. Das, Higher Engineering Mathematics, S. Chand, 2014
3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th edition

Course Outcomes: After completion of this course, the students will be able:

1. To know the concept of vector space, matrices and their various properties and also be able to solve the system of linear equations.
2. To solve the quadratic and bi-quadratic equations.
3. To solve the problems of gradients, divergent, curl and the applications of vector calculus.

4. To find the roots of complex numbers with the help of De-Moivre's theorem.
5. To know the convergence and divergence of infinite series using various type of tests.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING MATHEMATICS – B (AMUBTB4)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		1	1				1	2		2	1	1	2
CO2	3	2		1	1				1	2		2	1	1	2
CO3	2	2		1	1				1	2		2	1	1	2
CO4	2	2		1	1				1	2		2	1	1	2
CO5	2	2		1	1				1	2		2	1	1	2

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	PPUATB2	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	04
Subject:	ENGINEERING PHYSICS	3	1	-	15	15	10	40			

Course Objectives:

- To know the basic principles, effects and applications such as physical, optical parameters used for engineering applications.
- To learn about various laws and applications of electromagnetic theory.
- To know the basic structure, working principles and applications of lasers and optical fibre communication.
- To know the basics of semiconductor physics, semiconductor materials and devices and its characterization for advance technological applications
- To familiarize the basis of quantum theory and to make students to solve the physical problems for advancement of the technology.

Course Content:

Unit 1: Optics: Interference and Diffraction

Introduction, Young's experiment theory of interference, Coherent and non-coherent sources, Fresnel's Bi- prism and Newton's ring experiment.

Diffraction of light, Fresnel and Fraunhofer's diffraction, diffraction due to plane diffraction grating.

Unit 2 Electromagnetic Theory

Coulomb's law electrostatics field and potential, electric flux, Gauss' law, Poisson's and Laplace's equation. Equation of continuity for charge conservation, Ampere's and Faraday's laws, Maxwell's Electromagnetic equations.

Unit 3 Laser and Fiber optics

Introduction, elementary idea of spontaneous and stimulated emission, active medium population inversion, Einstein's coefficients, Types of lasers and important applications of lasers.

Introduction to optical fibers, basic principles of optical fiber, critical angle numerical aperture, maximum acceptance angle, classification of optical fiber.

Unit 4 Semiconductor physics and Devices

Formation of energy in solids, Energy band gap of metals, insulators and semiconductors, classification of semiconductor: Intrinsic and Extrinsic semiconductors, Fermi levels in intrinsic and extrinsic semiconductors, Electrical conductivity in conductors and semiconductors, working of P-N junction diodes and bipolar junction transistor.

Unit 5 Introduction to Quantum Mechanics

Introduction to Quantum Mechanics, photoelectric effect, Compton effect, wave-particle duality, uncertainty principle, wave function, De-Broglie waves, phase and Group velocity, Davisson and Germer experiment, Schrodinger wave equation, particle in a box (I-Dimensional)

Course Outcome: At the end of the course, students will be able to:

1. Student's ability to understand the basic principles and applications of physical optics for physical parameters measurements such as length, thickness, aperture size etc.
2. Student's will be able to design, characterized the lasers and optical fibers and their effective utilization in optical communications, imaging etc.
3. Students demonstrate appropriate competence and working knowledge of laws of

electromagnetic theory and semiconductor physics and devices for their advance applications

Textbooks/References:

1. Applied physics-I and II By Navneet Gupta, Dhanpat Rai &Co.
2. Engg. Physics by S.K. Srivastava and R.A. Yadav, New Age Pub. New Delhi
3. Engg. Physics by Uma Mukherjee, Narosa Publication.
4. Engg. Physics by M.N. Avadhanulu, S. Chand Pub.
5. Electricity and Magnetism by Rangwala and Mahajan, Tata McGraw Hill.1998
6. Concepts of Physics Part-II by H.C. Verma, Bharati Bhawan (P&D),1998
7. Modern physics by Beiser, McGraw Hill Inc. New York, Publication1995
8. Modern physics by Mani and Mehta, East-West PressPvt.Ltd.1998
9. Introduction to Electrodynamics, David Griffith
10. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-Hill Inc.(1995).
11. B.E.A. Saleh and M.C. Teich, Fundamentals of Photonics, John Wiley & Sons.Inc.2007).
12. S.M. Sze, Semiconductor Devices: physics and Technology, Wiley(2008)
13. Yariv and P. yeh, Photonics Optical Electronics in Modern Communications, Oxford University press, New York(2007)
14. P. Bhattacharya, Semiconductor Optoelectronic Devices, prentice Hall of India(1997)
15. Online course: "Semiconductor Optoelectronics" by M. R. Shenoy on NPTEL.
16. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak on NPTEL.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING PHYSICS (PPUBTB2)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2				1					1	3	2	1
CO2	1	1											3	2	1
CO3	3	3	2	3	3	2	2			1		1	3	2	1

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	ITUATE2	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	INTRODUCTION TO INFORMATION TECHNOLOGY	3	-	-	15	15	10	40			

Course Objective

1. To illustrate the concepts of cyber security and familiar and aware with various cybercrimes attack and their prevention.
2. To describe the different services model of Cloud Computing and understand Understanding of different evaluating computer model of cloud computing.
3. To relate theoretical concepts with problem solving approach in IoT and assess the comparative advantages and disadvantages of Virtualization technology.
4. To provides the basic knowledge of use appropriate storage and access structures. the student must be able to analyse familiar with the machine learning algorithms and applications of various data science.
5. To integrate classroom learning into an everyday communicative activity in distributed system. Familiar with various web services activity.

Course Content:

Unit 1: -Cyber Security Fundamentals Security Concepts: Authentication, Authorization, Non-repudiation, Confidentiality, Integrity, availability. Cyber Crimes and Criminals: Definition of cyber-crime, types of cyber-crimes and types of cyber-criminals.

Unit 2: -**Cloud Computing Fundamentals**: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models.

Unit 3: -Internet of Things–Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IOT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

Unit 4. Data Science: -Introduction and Importance of Data Science, Statistics, Information Visualisation, Data Mining, Data Structures, and Data Manipulation, Algorithms used in Machine Learning, Data Scientist Roles and Responsibilities. Data Acquisition and Data Science Life Cycle.

Unit 5: -Evaluation and Emergence of Web Services – Evaluation of Distributed Computing, Core Distributed Technologies, Challenges in Distributed System, and Introduction to web services, Web Services Architecture, Basic steps of implementing web services

Course Outcome:

1. Ability to learn about cybercrimes and how they are planned.
2. Ability to understand the cloud computing concepts and services model.
3. Ability to understand Internet of Things –Definition and Characteristics of IoT.

4. Explain how data is collected, managed and stored for data science. Understand the key concepts in data science, including their real-world applications and the toolkit used by data scientists
5. Explain the details of web services Evolution of Distributed Computing.

Textbooks/References:

1. Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group
3. Cloud Computing Principles and Paradigm by Rajashekar Buyya, James Broberg, Andhrz M. Wiley 2011.
4. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547.
5. Mining of Massive Datasets, by Leskovec, Rajaraman, and Ullman.
6. R. Nagappan, R.Scokzylas, R.P. Sriganesh, Developing Web Services, Wiley India.

Course Outcomes and their mapping with Programme Outcomes: INTRODUCTION TO INFORMATION TECHNOLOGY (ITUBTE2)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	2		2				2	1		
CO2	3	2	1	1	2	2		2				1	1		
CO3	3	2	1	1	2	2						2	1		
CO4	3	2	2	1	2	2		1				3	1		
CO5	3	2	1	1	2	2						1	1		

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	ECUATE3	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	BASIC ELECTRICAL ENGINEERING	3	-	-	15	15	10	40			

Course Objective

1. To analyze basic concepts of DC and AC circuits.
2. To explain construction and operation of transformers,
3. To explain the concept and working of DC machines and Induction motor.
4. To explain electric installation, wiring, billing and safety measures.

Unit-I: DC CIRCUITS (8 hours) Electrical circuit elements (R, L and C), voltage and current sources, Ohms Law, Kirchhoff's current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin andNorton Theorems. Time-domain analysis of first-order RL and RC circuits. Mesh & nodal analysis, Star- Delta transformation and circuits.

Unit-II: AC CIRCUITS (8 hours) Representation of sinusoidal waveforms, average and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections. Three-phase power measurement- Two- Wattmeter method.

UNIT-III: ELECTROMAGNETISM: (8 hours) Concept of Magnetic effect of electric current, faraday's law of electromagnetism. BH curve, Analogy of Electric and magnetic Circuits. Concept of flux flow in magnetic circuits. TRANSFORMERS Construction, classification, ideal and practical transformer, equivalent circuit, losses in transformers, tests, voltage regulation and efficiency. Introduction to three phase transformers.

UNIT IV: DC AND AC MACHINES: Construction, Working Principle, losses and efficiency of DC Machines and three phase Induction Machine, Torque Equations, DC motor: Principle of operation, speed control.

UNIT V: ELECTRICAL INSTALLATIONS& SAFETY: Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, Earthing – Types of earthing and its importance. Electrical wiring: Conduit and concealed wiring, Two way and Three-way control of lamps. Safety precautions for electrical appliances. Calculations for energy consumption and billing.

Suggested Text / Reference Books:

(i) D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.

(ii) D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.

(iii) B L Theraja and AK Theraja," A Textbook of Electrical Technology- Vol-I & II, S. CHAND &Co ltd, 2013.

(iv) E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.

(v) P.V. Prasad et al., Basic Electrical Engineering, Cengage 2019

Course outcomes:

At the end of the course, the student will be able to

1. Analyse basic DC electric circuits.
2. Analyse basic AC electric circuits.
3. Explain the working principles of transformers and its tests.
4. Explain the concepts of DC and AC machines and their applications
5. Understand the wiring methods, working principles of circuit protective devices, electrical billing and safety measures

Course Outcomes and their mapping with Programme Outcomes: BASIC ELECTRICAL ENGINEERING (ECUATE3)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1		1						3	3		2
CO2	3	2	2	1		1						3	3		2
CO3	3	2	2	1		1						3	3		2
CO4	3	2	2	1		1						3	3		2
CO5	3	2	2	1		1						3	3		2

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	ELUATH1	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	ENGLISH FOR COMMUNICATION	3	0	-	15	15	10	40			

Course Learning Objectives

- To build up word power, to brush up the knowledge of English grammar, to develop good writing and speaking skills in the students

Course Content:

Unit 1: -Vocabulary Building

The concept of Word Formation, Root words from foreign languages and their use in English, Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives. Synonyms, antonyms, and standard abbreviations.

Unit 2: -Basic Writing Skills

Sentence Structures, Use of phrases and clauses in sentences, Importance of proper punctuation, Creating coherence, Organizing principles of paragraphs in documents, Techniques for writing precisely

Unit 3: -Identifying Common Errors in Writing

Subject-verb agreement, Noun-pronoun agreement, Misplaced modifiers, Articles, Prepositions, Redundancies, Clichés

Unit 4: -Nature and Style of sensible Writing

Describing, Defining, Classifying, Providing examples or evidence, Writing introduction and conclusion.

Unit 5: -Writing Practices

Comprehension, Précis Writing, Essay Writing.

Oral Communication (This unit involves interactive practice sessions in Language Lab)
Listening Comprehension
Pronunciation, Intonation, Stress and Rhythm
Common Everyday Situations: Conversations and Dialogues
Communication at Workplace
Interviews
Formal Presentations

Course Outcome:

1. At the end of the course students will be able learn a lot of new words. They also learnt the particularities and peculiarities of English grammar. As a result, they could speak and write English with the least possible error

Textbooks/References:

1. Practical English Usage. Michael Swan. OUP.1995.
2. Remedial English Grammar. F.T. Wood. Macmillan.2007 (iii)On Writing Well. William Zinsser. Harper Resource Book.2001
3. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press.2006.
4. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press.2011.
5. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford UniversityPress

Course Outcomes and their mapping with Programme Outcomes: ENGLISH FOR COMMUNICATION (ELUBTH1)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1	1	1	2	1		1	3	3	2	3			1

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	ECUATH2 (for ECE) CSUATH2 (for CSE) ITUATH2 (for IT)	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	-	50	1
Subject:	HUMAN VALUES & ETHICS	1	0	-	20	20	10	50			

COURSE OBJECTIVE:

1. To create an awareness on Engineering Ethics and Human Values.
2. To understand social responsibility of an engineer.
3. To appreciate ethical dilemma while discharging duties in professional life.

COURSE OUTCOME:

On completion of this course, the students will be able to

1. Understand the significance of value inputs in a classroom and start applying them in their life and profession
2. Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
3. Understand the role of a human being in ensuring harmony in society and nature.
4. Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

COURSE CONTENT:

UNIT I: Introduction to Value Education

1. Value Education, Definition, Concept and Need for Value Education.
2. The Content and Process of Value Education.
3. Basic Guidelines for Value Education.
4. Self exploration as a means of Value Education.
5. Happiness and Prosperity as parts of Value Education.

UNIT II: Harmony in the Human Being

1. Human Being is more than just the Body.
2. Harmony of the Self ('I') with the Body.
3. Understanding Myself as Co-existence of the Self and the Body.
4. Understanding Needs of the Self and the needs of the Body.
5. Understanding the activities in the Self and the activities in the Body.

UNIT III: Harmony in the Family and Society and Harmony in the Nature

1. Family as a basic unit of Human Interaction and Values in Relationships.
2. The Basics for Respect and today's Crisis: Affection, e, Guidance, Reverence, Glory,Gratitude and Love.
3. Comprehensive Human Goal: The Five Dimensions of Human Endeavour.
4. Harmony in Nature: The Four Orders in Nature.
5. The Holistic Perception of Harmony in Existence.

UNIT IV: Social Ethics

1. The Basics for Ethical Human Conduct.
2. Defects in Ethical Human Conduct.
3. Holistic Alternative and Universal Order.
4. Universal Human Order and Ethical Conduct.
5. Human Rights violation and Social Disparities.

UNIT V: Professional Ethics

1. Value based Life and Profession.
2. Professional Ethics and Right Understanding.
3. Competence in Professional Ethics.
4. Issues in Professional Ethics – The Current Scenario.
5. Vision for Holistic Technologies, Production System and Management Models.

TEXT BOOKS

1.A.NTripathy, New Age International Publishers, 2003.
2.Bajpai. B. L , , New Royal Book Co, Lucknow, Reprinted, 2004
3.Bertrand Russell Human Society in Ethics & Politics

REFERENCE BOOKS

1.Corliss Lamont, Philosophy of Humanism
2.Gaur. R.R. ,Sangal. R, Bagaria. G.P, A Foundation Course in Value Education, Excel Books, 2009.
3.Gaur. R.R. ,Sangal. R ,Bagaria. G.P, Teachers Manual Excel Books, 2009.
4.I.C. Sharma . Ethical Philosophy of India Nagin & co Julundhar
5.Mortimer. J. Adler, – Whatman has made of man
6.William Lilly Introduction to Ethic Allied Publisher

Course Outcomes and their mapping with Programme Outcomes: HUMAN VALUES AND ETHICS {ECUATH2 (for ECE), CSUATH2 (for CSE) and ITUATH2 (for IT)}

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1								3	3						
CO2								3	3						
CO3								3	3						
CO4								3	3						

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	PPUALB2	L	T	P	IA	MSE	TOTAL			
Subject:	ENGINEERING PHYSICS LABORATORY	-	-	2	25	--	25	25	50	01

Course Objectives:

1. To learn and perform the various practical related to optics and its related phenomena's like interference, diffraction and polarization.
2. To apply basic optical phenomena's for measurements such as thickness, refractive index, dispersive power, aperture size etc.
3. To characterized various optical sources such as laser, mercury light, sodium light, gratings, prism and lens.
4. To characterize various semiconductor materials and devices (PN Jn., Transistor, LED and Solar Cell) for their energy band gap, resistivity and IV characteristics.

Course Content:

LIST OF PRACTICALS:

1. To determine the wavelength of sodium light with help of Fresnel's Bi-prism.
2. To determine the refractive index and dispersive power of the material of prism with the help of spectrometer.
3. To determine the sodium light by Newton's ring method.
4. To determine the wavelength of sodium light by plane diffraction grating using spectrometer.
5. To demonstrate the diffraction pattern and determine the wavelength of different colours of mercury (white) light using plane diffraction grating and spectrometer.
6. To determine the wavelength and number of line per cm on a diffraction grating using semiconductor laser diode.
7. To determine the specific rotation of sugar solution with the help of polarimeter.
8. Determine the width of the single slit and diameter of circular aperture using Fraunhofer diffraction pattern produced by semiconductor laser diode.
9. To determine the energy band gap (E_g) of a semiconductor material using P-N junction diode.
10. To determine the e/m ratio by the Thomson's method.
11. To study the P-N junction diode characteristics, in forwarded and reverse bias conditions.
12. To study the Zener diode characteristics.
13. To study the characteristics and gain of Transistor in C-B and C-E mode.
14. Determine the Planck's constant.

Course Outcomes: On completion of the course, the students would be able to:

1. Know about basic optical facts and phenomenon, characterization of optical components and devices
2. To know the basic semiconductor materials and devices and their applications
3. To know how the performance of semiconductor devices can be improves.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING PHYSICS LABORATORY (PPUBLB2)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	2	2	1			2			2	2	2	1
CO2	2	2	3	2	2	1			2			2	2	2	1
CO3	2	2	3	2	2	1			2			2	2	2	1

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-I)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	MEUALL1	L	T	P	IA	MSE	TOTAL	25	50	01
Subject:	ENGINEERING GRAPHICS	1	-	3	25	--	25			

Course Learning Objectives:

1. To learn the basic of Engineering Drawing and Orthographic Projections
2. To learn the Sections and Sectional Views of Right Angular Solids
3. To learn the Isometric Projections covering and overview of Computer Graphics

UNIT 1:Introduction Engineering Graphics and Engineering Curves: Principles of engineering graphics and their significance – drawing instruments and their use – conventions in drawing – lettering – BIS conventions. Dimensioning rules, geometrical construction. Engineering Curves - Conic Sections, Special Curves-Cycloids, Epicycloids, Hypocycloids, Involutes and trochoid.

UNIT 2:Projection of Points, Straight lines and Planes: Principles of orthographic projections – conventions – first and third angle projections. Projections of points and lines inclined to both the planes. Projections of regular planes, inclined to both planes

UNIT 3:Projections Solids: Introduction, Type of solid, Projections of solids in simple position, Projection of solids with axes inclined to one of the reference planes and parallel to the other, Projections of solids with axes inclined to both H.P. and the V.P.

UNIT 4: Section of Solids and Development of Surfaces: Sectioning of regular solids - Section planes perpendicular to one plane and parallel or inclined to other plane - Development of surfaces of right, regular solids – development of prisms, cylinders, pyramids, cones and their parts.

UNIT 5: Isometric Projections and Orthographic Views: Principles of Isometric Projections-Isometric Scale- Isometric Views Conventions-Plane Figures, Simple and Compound Solids. Conversion of isometric views to orthographic views. Conversion of orthographic views to isometric projections, vice-versa. Introduction to perspective projection.

Computer Aided Drafting: Introduction to computer aided drafting package to make 2-D drawings. Demonstration purpose only - not to be included in examinations.

Textbooks/References:

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, PearsonEducation
3. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
4. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers
5. CAD Software Theory and User Manuals

Course Outcomes:

At the end of the course, the student shall be able to

1. Describe the fundamentals of engineering drawing and construct basic engineering curves.
2. Enhance visualization skill using projections of points, lines and planes.
3. Enhance visualization skill using projections of solids.
4. Enhance visualization skill using construction of sections of solids and development of surfaces.
5. Comprehend the theory of Orthographic and Isometric projections and views

Course Outcomes and their mapping with PO and PSO: ENGINEERING GRAPHICS (MEUBLL1)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2									2					
CO2	1									1					
CO3	3									3					
CO4	3									3				1	
CO5	1									1				1	

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-I)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	ECUALE3	L	T	P	IA	MSE	TOTAL	25	50	01
Subject:	BASIC ELECTRICAL ENGINEERING LABORATORY	-	-	2	25	--	25			

Course Objectives:

1. To understand basic instruments and safety measures.
2. To practically provide the concept of different theorems.
3. To understand the concept of RLC circuits.
4. To understand the working of transformers
5. To understand the concept of DC and AC machines.

List of experiments/demonstrations:

- Basic safety precautions. Introduction and use of measuring instruments – voltmeter, ammeter, multi-meter, oscilloscope. Real-life resistors, capacitors and inductors.
- To verify various theorems on DC circuits
- Measuring the steady-state and transient time-response of R-L, R-C, and R-L-C circuits to a step change in voltage (transient may be observed on a storage oscilloscope).
- Sinusoidal steady state response of R-L-C circuits – Single-phase and Three-phase circuit measurement
- Transformers: Polarity test, OC & SC tests. Loading of a transformer: measurement of primary and secondary voltages and currents and power.
- Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), and single-phase induction machine.

Course Outcomes: At the end of the course students will be able to:

1. Acquire knowledge about different types of meters and construct circuits and measure different electrical quantities.
2. Analyse the DC circuits
3. Analyse Single Phase and Three phase AC Circuits, the representation of alternating quantities and determining the power in these circuits
4. Work on machines like transformers
5. Understand the construction of DC and AC machines

Course Outcomes and their mapping with PO and PSO: BASIC ELECTRICAL ENGINEERING LABORATORY (ECUALE3)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2			1						2	3		1
CO2	3	1	2			1						2	3		1
CO3	3	1	2			2						2	3		1
CO4	3	1	2			2						2	3		1
CO5	3	1	2			2						2	3		1

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

NSS

SYLLABUS	(SEMESTER-I)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE Viva/ Assessment	Grand total	Credits
Subject Code:	NSUALS1	L	T	P	Attendance	Activities	TOTAL	25	50	01
Subject:	NSS	-	-	2	5	20	25			

Objectives:

1. To develop Personality
2. To do Community Service
3. To do social Awareness and Empowerment
4. To enhance Skill
5. To work for National Integration

Course:

Program Head 1: Cleaning Program **(06 Hours/ Semester)**

Program Head 2: Plantation **(06 Hours/ Semester)**

Program Head 3: Health Camp/Special Days celebration **(10 Hours/ Semester)**

Program Head 4: Awareness program/Ralley **(06 Hours/ Semester)**

Course Outcomes:

At the end of this course, students will demonstrate the ability to:

1. Observe his/her internal ability and develop own personality.
2. Apply knowledge of the importance of cleanliness and hygiene in their surroundings, and develop skills in waste management and recycling.
3. Apply knowledge towards the significance of greenery and environmental conservation, participate in tree plantation drives, and understand the process of nurturing and caring for plants.
4. Apply knowledge of health issues prevalent in the community and methods of prevention and organizing health camps and awareness programs on special days like World Health Day or World AIDS Day.
5. Express social issues and their impact on the community. Actively participate in awareness programs and rallies to create awareness about social problems like gender inequality, or environmental degradation.

Course Outcomes and their mapping with PO and PSO: NSS (NSUBLS1)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1									1						
CO2			1			1	2								
CO3			1			1	2								
CO4			1			1	2								
CO5			1			1	2								

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	AMUBTB1	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	04
Subject:	ENGINEERING MATHEMATICS - A	3	1	-	15	15	10	40			

Course Objectives:

1. To study the mean value theorem and nth derivative.
2. To study the indeterminate forms, partial and total differentiation.
3. To study the various concepts of integral calculus such as reduction formula, area, volume and length.
4. To study the ordinary and partial differential equations.
5. To study the applications of ordinary and partial differential equations

UNIT-1: **Differential Calculus**
Leibnitz theorem, Roll's theorem, Lagrange's theorem, Mean value theorem, Expansions of functions by McLaurian and Taylor's series, Tangents and normal, Maxima and minima

UNIT-2:
Indeterminate forms, Asymptotes, Radius of curvature, Partial differentiation, Total differentiation

UNIT-3: **Integral Calculus**
Reduction formulae, Curve tracing, Area, Volume, Length, Surface area, Double and triple integrals, Gamma and beta function.

UNIT-4: **Differential Equations**
Differential equations of first order, Linear differential equation of higher order with constant coefficient, Equations reducible to linear equations with constant coefficients, Cauchy's homogeneous linear equations, Application of linear differential equations, Simultaneous differential equations.

UNIT-5:
Series solution of differential equations about ordinary point, Partial differential equations, linear homogeneous partial differential equations, application of partial differential equations: One dimensional heat equation and wave equation.

Recommended Books:

1. N.P. Bali, A Textbook of Engineering Mathematics, Laxmi publications, 10th edition, 2016.
2. H.K. Das, Higher Engineering Mathematics, S. Chand, 2014
3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 44th edition

Course Outcomes: After completing the course, the students will be able to:

1. Expand the function in Maclaurin's and Taylor's series.
2. Find the limit of some indeterminate forms and solve the problems of partial and total differentiation.
3. Solve the problems related to area, volume and length.
4. Solve the ordinary and partial differential equations.
5. Solve the engineering problems using differential equations.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING MATHEMATICS – A (AMUATB1)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		1	1				1	2		2	1	1	2

CO2	3	2		1	1				1	2		2	1	1	2
CO3	3	2		1	1				1	2		2	1	1	2
CO4	3	3		1	1				1	2		2	1	1	2
CO5	3	3		1	1				1	2		2	1	1	2

Weightage: 1-Sightly, 2-Moderately, 3-Strongly

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	CYUBTB3	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	ENGINEERING CHEMISTRY	3	-	-	15	15	10	40			

Course Objectives:

The objective of this Course is to:

- To make aware and enrich the the students about the basic concept and understanding of chemical concepts of basic Chemistry and spectroscopictechniques.

Course Content:

UNIT-1: I Concept of Quantum Energy and Spectroscopy: Quantization of Energy, Regions of spectrum. Electronic Spectroscopy: Electronic Transition, Woodward Fieser rules for calculating λ_{max} of conjugated dienes & α, β-unsaturated carbonyl compound, various shifts in λ_{max} and intensities. Infra-Red Spectroscopy: Conditions for Infra-Red Spectroscopy, Molecular vibrations & factors affecting Infra-Red frequencies**.**

UNIT-2: Chemical Bonding in Molecules: Introduction of chemical bonding, VSEPER Theory, V.B.Theory and Molecular Orbital Theory. Energy level diagrams of diatomic molecules and ions.

UNIT-3: Concept of Chirality, Enantiomers, Diastereomers,Meso-compounds and Racemic mixtures. Conformation of Acyclic hydrocarbons (Ethane, Propane & n-Butane) and cyclic hydrocarbon (Cyclohexane), Plane of symmetry, Centre of symmetry, Absolute and Relative Configuration (R &S, D & L and E & Z).

UNIT -4: Reactivity of Organic Molecules, Factors influencing acidity, basicity and nucleophilicity of molecules, kinetic vs thermodynamic control of reactions.

UNIT -5: Strategy for Synthesis of Organic Compounds: Reaction intermediates: Stability of Free Radicle, Carbocation and Carbanion. Introduction to reaction eg. Elimination and Substitution, Mechanisms of some named reactions.

Course Outcomes- At the end of the course the students will be able to understand and solve the practical problems of their higher Engineering classes on the basis of understanding of Chemistry developed in their B. Tech. I sem classes.

Textbooks/References:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai PublicationCo.
2. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2015edition.
3. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others, 2014 edition(second).
4. Engineering Chemistry by Prasanth Rath, Cengage Learning, 2015edition.
5. A textbook of Engineering Chemistry by S. S. Dara; S. Chand & Co Ltd., LatestEdition
6. Applied Chemistry by H.D. Gesser, SpringerPublishers
7. Textbook of Nano-science and nanotechnology by B.S. Murthy, P. Shankar and others, University Press,IIM
8. B. Siva Shankar, “Engineering Chemistry”, Tata Mc Graw Hill Publishing Limited, 3rd Edition, 2015.
9. S. S. Dara, Mukkanti, “Text of Engineering Chemistry”, S. Chand & Co, New Delhi, 12th Edition, 2006.
10. C. V. Agarwal, C. P. Murthy, A. Naidu, “Chemistry of Engineering Materials”, Wiley India, 5th Edition, 2013.
11. R. P. Mani, K. N. Mishra, “Chemistry of Engineering Materials”, Cengage Learning, 3rd Edition,

2015.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING CHEMISTRY (CYUATB3)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2			1						1	1		
CO2	2	1	1									1	1		
CO3	2	1	1									1	1		
CO4	2	1	1									1	1		
CO5	2	1	1									1	1		

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	CSUBTE5	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	COMPUTER PROGRAMMING	3	-	-	15	15	10	40			

Course Objectives:

- To learn the basic ideas of the Algorithms and Flowcharts.
- To learn Basic C concepts Data types and Control statements.
- To learn the Functions and Structure of Array.
- To learn the concepts of Sorting and Searching Algorithms.
- To learn basic concepts of Linked List Notations.

Course Content:

UNIT-1: Introduction to Programming
Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.) -
Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudo code with examples. From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code.

UNIT-2: **Arithmetic expressions and precedence**
Conditional Branching and Loops, Writing and evaluation of conditionals and consequent branching Iteration and loops, **Arrays** (1-D, 2-D), Character arrays and strings

UNIT-3: Basic Algorithms
Searching, concept of binary search etc., Basic Sorting Algorithms Bubble sort etc., Finding roots of equations, introduction of Algorithm complexity

UNIT-4: Function
Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference binary search etc.
Recursion functions Recursion, as a different way of solving problems. Example programs, such as, Finding Factorial, Fibonacci series, etc.

UNIT -5: Structure
Structures, Defining structures and Array of Structures
Pointers Idea of pointers, defining pointers, Use of Pointers in self-referential structures, notion of linked list (no implementation)

Course Outcomes- At the end of the course students will be able to
1. Understand the designing of basic level Algorithm and Flowcharts.
2. Understand the C programming fundamentals on the different Control Statements, Functions and Arrays.
3. Understand the Searching, Sorting Algorithms and concepts of linked list operations.

Textbooks/References:

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
3. Brian W. Kernighan and Dennis M. Ritchie, the C Programming Language, Prentice Hall of India

Course Outcomes and their mapping with Programme Outcomes: COMPUTER PROGRAMMING (CSUATE5)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	2				1	2	2	1	3	2	2	3
CO2	3	2	3	2	3			1	2	2	1	3	2	2	3
CO3	3	2	3	2	3				2	2	1	3	2	2	2

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	ECUBTE6	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	03
Subject:	BASIC COMMUNICATION ENGINEERING	3	-	-	15	15	10	40			

Course Content:

Unit-I Basic of Signals and System: Introduction to continuous time and discrete time signals, Classification of signals with their mathematical representation and characteristics. Introduction to various type of system, basic system properties.

Basic Operations on signals: Amplitude scaling, addition, multiplication, differentiation, integration, time scaling, time shift and time reversal.

Unit-II Basic of Communication system: Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium,Noise, Receiver, Types of communication systems**.** Modulation, Need of Modulation, Amplitude Modulation (AM) system, Frequency Modulation (FM) system, Phase modulation (PM) systemcomparison between AM and FM.

Unit III Digital Modulation System: Sampling Theorem, Quantization, Pulse code Modulation (PCM), Pulse Amplitude Modulation (PAM), Pulse Position Modulation (PPM), Pulse Width Modulation (PWM), Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK)**,** Phase Shift Keying (PSK).Concept of Radio wave propagation (Ground, space, sky),Introduction to Antenna ,Multiple access Techniques.

Unit-IV Cellular Wireless Networks - Introduction, cellular telephone system, cellular concept and frequency reuse.

Wireless Network Topologies - First Generation (1G) Technology, Second Generation (2G) Technology, GSM Communications, GSM System architecture, Third Generation (3G) Technology, CDMA Technology, High-level architecture of LTE, Fourth Generation (4G) Technology, Wireless LAN, Bluetooth, Bluetooth Architecture.

Satellite Communication – Elements of Satellite Communication, Types of satellites – GEO, LEO, MEO.

Optical Fiber Communication - A fiber optic Communication system.

Microwave Communication – Introduction, microwave communication system**.**

Unit-V Embedded Systems – Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System,

Core of the Embedded System:Microprocessor vs Microcontroller, RISC vs CISC, Harvard vs Von-Neumann

Sensors and Interfacing – Data Acquisition System, Transducers, Sensors.**Actuators:** LED, 7-Segment LED Display, Stepper Motor, Relay, Piezo Buzzer, Push Button Switch, Keyboard.

Communication Interface: UART, Parallel Interface, USB, Wi-Fi, GPRS.

TEXT BOOK:

1. S L Kakani and Priyanka Punglia, 'Communication Systems', New Age International Publisher, 2017
2. Taub and Schilling, 'Principles of Communication Systems', McGraw Hill Education.
3. Geroge Kennedy, 'Electronic Communication Systems', McGraw Hill Education

Course Outcome:

At the end of the course the student will be able to:

1. Describe the concepts of signal and system
2. Know the basics of Analog communication system.
3. Know the basics of Digital communication system.
4. Explain the different modes of communications from wired to wireless and the computing involved.

5. Discuss the characteristics and technological advances of embedded systems andthe microcontroller system with associated sensors and actuators.

Course Outcomes and their mapping with Programme Outcomes: BASIC COMMUNICATION ENGINEERING (ECUBTE6)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1							3	3	1	1
CO2	3	2	1	1	1							3	3	1	1
CO3	3	2	1	1	1							3	3	1	1
CO4	3	2	1	1	2							3	3	1	1
CO5	3	2	1	1	2							3	3	1	1

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	LAUBTC1	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	-	50	01
Subject:	INDIAN CONSTITUTION	1	-	-	20	20	10	50			

Course Learning Objectives:

- To the importance of preamble of the constitution of India.
- To understand the fundamental rights and duty as a citizen of India.
- To understand the functioning of union and state government and their inter-relationship.

Course Content:

UNIT 1: Introduction: Constitution-meaning of the term, Sources and constitutional theory, Features, Citizenship. Preamble**.**

UNIT 2: Fundamental Rights and Duties: Fundamental Rights, Fundamental Duties, Directive Principles of State Policy

UNIT 3: Union Government: Structure of Indian Union: Federalism, Centre-State relationship President: Role. Power and position, Prime Minister and council of ministers, Cabinet and Central Secretariat, Lok Sabha. Rajya Sabha

UNIT 4: State Government: Governor: Role and position, Chief Minister and council of ministers, State Secretariat

UNIT 5: Relationship between Centre and States: Distribution of Legislative Powers, Administrative Relations, Coordination between States

Textbooks/References:

1. Constitution of India, V.N. Shukla
2. The Constitutional Law of India, J.N. Pandey
3. Indian Constitutional Law. M.P. Jain

Course Outcome: At the end of the course students will be able to:

1. Describe the salient features of the Indian Constitution
2. List the Fundamental Rights and Fundamental Duties of Indian citizens
3. Describe the Directive Principles of State Policy and their significance

Course Outcomes and their mapping with Programme Outcomes: INDIAN CONSTITUTION (LAUATC1)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1						2		3				1			
CO2						2		3				1			
CO3						2		3				1			

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			Internal Assessment (IA)				ESE	Grand Total	Credits
Subject Code:	FOUBTC2	L	T	P	CT-1	CT-II	Attendance & Assignments	TOTAL	60	100	02
Subject:	ENVIRONMENTAL SCIENCE AND ECOLOGY	2	-	-	15	15	10	40			

Course Learning Objectives:

- To understand the concept of ecosystem and environment and its importance for sustaining life on earth.
- To be aware of the various natural resources and different types of pollution and its management.
- To gain knowledge on the sources and different types of energy for meeting daily human needs.

Course Content

UNIT – I
Introduction: Environment - Components of Environment Ecosystem: Types & Structure of Ecosystem, Balanced ecosystem Human Activities – Food, Shelter, Economic & Social Security.
Definition, Scope and basic principles of ecology and environment, Fundamentals of Ecology and Ecosystem – Structural and Functional Components. Food chain & Food webs. Ecological pyramids; Energy flow

UNIT – II
Air Pollution & Automobile Pollution: Definition, Effects – Global Warming, Acid rain
& Ozone layer depletion, controlling measures.

UNIT-III
Solid Waste Management, E - Waste Management & Biomedical Waste Management - Sources, Characteristics & Disposal methods.

UNIT – IV
Natural Resources, Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water, Mineral resources, Forest Wealth, Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle.

UNIT-V
Energy – Different types of energy, Conventional sources & Non-Conventional sources of energy: solar energy, Hydro-electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy.

Text Books

1. Fundamentals of Ecology (3rd Ed.) 2001- MC Dash, Tata - McGraw Hill, New Delhi.
2. Introduction to Environmental Engg. (1991). - GM Masters, Prentice Hall of India.
3. Benny Joseph (2005), "Environmental Studies", Tata McGraw – Hill Publishing Company Limited.
4. R.J.Ranjit Daniels and Jagadish Krishnaswamy, (2009), "Environmental Studies",Wiley India Private Ltd., New Delhi.
5. R Rajagopalan, "Environmental Studies – From Crisis to Cure",Oxford University Press, 2005,
6. Aloka Debi, "Environmental Science and Engineering", Universities Press (India) Pvt. Ltd. 2012

Course Outcome: At the end of the course students will be:

1. Acquainted with different types, needs and importance of ecosystem and environmental components on earth.
2. Aware of and able to sustainably manage the natural resources and different types of pollution caused by anthropogenic activities.
3. Able to identify and know the different types and sources of energy and the strategies to conserve the conventional energy.

Course Outcomes and their mapping with Programme Outcomes: ENVIRONMENTAL SCIENCE AND ECOLOGY (FOUATC2)

COs	POs												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1							3		1			1			
CO2							3		1			1			
CO3							3		1			1			

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	CYUBLB3	L	T	P	IA	MSE	TOTAL	25	50	01
Subject:	ENGINEERING CHEMISTRY LABORATORY	-	-	2	25	--	25			

Course Objectives:

The Lab sessions would help in learning:

- Application of iodometrically & titration in lab.
- Recognition of different chemical reaction.
- Advanced lab methods like Spectrophotometry and chromatography

Course Content:

Group – A:

1. Standardization of sodium thiosulphate solution by standard potassium dichromate solution.
2. To determine the Normality and Strength (g/L) of given Ferrous Ammonium Sulphate solution 'A' using standard Ferrous Ammonium Sulphate (N/30) solution 'B' taking KMnO4 solution as an intermediate.
3. To determine the concentration of hypo solution ($Na_2S_2O_3.5H_2O$) iodometrically with given Iodine (N/50) solution.
4. Find out the Temporary hardness of given water sample using 0.01M EDTA solution, buffer solution (pH-10) and EBT as an indicator.
5. To determine chloride ion in a given water sample by Argentometric method (Mohr's method)

Group – B:

6. Preparation of Urea Formaldehyde resin.
7. Acetylation of Primary Amine: Preparation of Acetanilide.
8. Base Catalyzed Aldol Condensation: Synthesis of dibenzal propanone.
9. [4+2] Cycloaddition Reaction: Diels-Alde reaction.
10. Preparation of aspirin and calculate its yield.

Group – C:

11. To calculate the λ_{max} of a given compound using UV-visible spectrophotometer.
12. To separate the metallic ions by paper chromatography.
13. To determine the surface tension of a liquid by stalagmometer.
14. To determine the percentage composition of the given mixture consisting of two liquids A and B (non- interacting system) by viscosity method.
15. To determine the relative viscosity of given liquids by Ostwald's viscometer.

Note: At least two Experiments from each group must be performed.

Course Outcomes- On completion of the course, the students will be able to

1. Have develop basics of volumetric analysis and required calculation ability.
2. Develop ability to perform organic reactions calculate their yields etc.
3. Develop knowledge regarding analytical tools and colligative properties of molecules.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING CHEMISTRY LABORATORY (CYUALB3)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1						1			1	1		1

CO2	2	2	1						1			1			1
CO3	2	2	1	1	1				1			1	1		1

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	IPUBLL2	L	T	P	IA	MSE	TOTAL	25	50	01
Subject:	ENGINEERING WORKSHOP PRACTICES	-	-	2	25	--	25			

Course objectives:

- To impart student knowledge on various hand tools for usage in engineering applications.
- Be able to use analytical skills for the production of components, electrical switch board wiring and logic gate.

Course Content:

1. Study of M/C tools in lathe machine
   Demonstration of different operations of lathe machine
   Practice of facing plain turning, taper turning etc

2. Study of Carpentry tools, equipments and different jobs
   Practice of Lap joints, Butt joints, T-Lab joints

3. Practice of Lap joint, Butt Joint, T-joint

4. Preparation of ¥ shape, square shape, work pieces as per the given specification

5. Replacement of fuse, condenser of fan/motor and fan regulator;
   Installation of switch board with wiring;
   Concepts of measuring instruments.

6. Identification of various electronics components and their terminals;
   Study of logic gates AND, OR, XOR and NOT, NAND, NOR;
   Study of Basic ICs.

Course Outcomes: At the end of the course, students will be able to:

1. Understand the appropriate tools, materials, instruments required for specific operations in workshop.
2. Understand the figures of the hand tools used in fitting, carpentry, welding shop and machine tools such as lathe machine.
3. Understand report of procedures followed for a given task in fitting, carpentry, welding and machine shops.
4. Basic understanding of electrical equipment fitting and understanding of electronic logic gates AND, OR, NOT and ICs.
5. Basic understanding of electrical equipment fitting and understanding of electronic logic gates AND, OR, NOT and ICs. Apply techniques to perform basic operations with hand tools and power tools such as center lathe machine, fitting shop, carpentry, welding using given job drawing.

Textbooks/References:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of WorkshopTechnology", Vol. I 2008 and Vol. II 2010, Media promoters and publishersprivate limited,Mumbai.
2. Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition,

Pearson Education India Edition,2002.
3. Gowri P. Hariharan and A. Suresh Babu, "Manufacturing Technology – I" Pearson Education, 2008. (iv)Roy A. Lindberg, "Processes and Materials of Manufacture", 4th edition, PrenticeHallIndia, 1998.
4. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata Mc-Graw Hill House,2017.

Course Outcomes and their mapping with Programme Outcomes: ENGINEERING WORKSHOP PRACTICES (IPUALL2)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2								2						
CO2	2								3						
CO3	2								1						
CO4	2								2					1	
CO5	1								3					1	

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SYLLABUS	(SEMESTER-II)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE	Grand total	Credits
Subject Code:	CSUBLE5	L	T	P	IA	MSE	TOTAL	25	50	01
Subject:	COMPUTER PROGRAMMING LABORATORY	-	-	2	25	--	25			

Course Learning Objectives:

- To learn the Branching and logical expressions and Loops
- To learn the Arrays and Function
- To understand the Numerical methods and Recursion

Course Content:

The laboratory should be preceded or followed by a tutorial to explain the approach or Algorithm to be implemented for the problem given.

Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment

Tutorial 2: Variable types and type conversions:
Lab 2: Simple computational problems using arithmetic expressions

Tutorial 3: Branching and logical expressions:
Lab 3: Problems involving if-then-else structures

Tutorial 4: Loops, while and for loops:
Lab 4: Iterative problems e.g., sum of series

Tutorial 5: 1D Arrays: searching, sorting:
Lab 5: 1D Array manipulation

Tutorial 6: 2D arrays and Strings
Lab 6: Matrix problems, String operations

Tutorial 7: Functions, call by value:
Lab 7: Simple functions

Tutorial 8 &9: Numerical methods (Root finding, numerical differentiation, numerical Integration):
Lab 8 and 9: Programming for solving Numerical methods problems

Tutorial 10: Recursion, structure of recursive calls
Lab 10: Recursive functions

Tutorial 11: Pointers, structures and dynamic memory allocation
Lab 11: Pointers and structures

Course Outcomes- At the end of the course students will be able to

1. Design basic level Algorithms and Flowcharts.
2. Understand C programming fundamentals on the different Control Statements, Functions and Arrays.
3. Understand the programing concepts of Recursion, Searching, Sorting Algorithms.
4. Write C programs for basic engineering solutions.

Course Outcomes and their mapping with Programme Outcomes: COMPUTER PROGRAMMING LABORATORY (CSUALE5)

CO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	2	3				2	1	2	3	3	3	2
CO2	3	3	3	2	2				2	2	2	3	3	3	2
CO3	3	3	3	2	3				2	2	2	3	3	3	2
CO4	3	3	3	2	3				2	3	3	3	3	3	2

Weightage: **1-Sightly; 2-Moderately; 3-Strongly**

SPORTS & YOGA

SYLLABUS	(SEMESTER-II)	Periods/ Week			INTERNAL ASSESSMENT (IA)			ESE Assessment	Grand total	Credits
Subject Code:	PEUBLS2	L	T	P	Attendance	Activities	TOTAL			
Subject:	SPORTS AND YOGA	-	-	2	5	20	25	25	50	01

Course Objectives:

- To make the students understand the importance of sound health and fitness principles as they relate to better health.
- To expose the students to a variety of physical and yogic activities aimed at stimulating their continued inquiry about Yoga, physical education, health, and fitness.
- To create a safe, progressive, methodical, and efficient activity-based plan to enhance improvement and minimize risk of injury.
- To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

Physical Fitness Tests

- AAHPER youth fitness test
- Cooper's 12 Minute run-walk test

General Introduction of games and sports

Fundamental skills, history and development of the following games and sports:

- Athletics
- Batminton
- Basketball
- Cricket
- Football
- Hockey
- Handball
- Kabaddi
- Kho-kho
- Volley-ball
- Yoga

Note:

1. Each student will have to clear one of the physical fitness tests by the end of the semester.
2. One project is to be prepared by the students at least for two games.

References:

1. Barron H M, McGhee R (1997) A Practical Approach to Measurement in Physical Education.
2. Kansal D K (1996), Test and Measurement in sports and physical education, New Delhi, D V S Publication

Course Outcomes:

On completion of the course, the student will be able to:

1. Apply warming up and warming down exercises in daily physical fitness activities
2. Apply stretching rotation and flexibility exercises in daily physical fitness activities.
3. Make use of acquired yoga asanas skill and pranayama method in daily lifestyle.
4. Utilize the acquired weight training skills for the development of muscular strength and development. Utilize the acquired skills in playing sports and games.

Course Outcomes and their mapping with Programme Outcomes: SPORTS AND YOGA (PEUALS2)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1									3			3			
CO2									3						
CO3									3			3			
CO4									3			3			

Weightage: 1-Sightly, 2-Moderately, 3-Strongly